

Lie Detection

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The truth *is* out there. Somewhere. We know this because the X Files tells us so. However-- somewhere-- between TV land and real life it seems to have gotten lost. Wouldn't you like to find it? Have you ever wondered if the love of your life is really spending all that time at the library? Or if your local politician really has your best interests at heart? Today, the desire to perfect lie detection technology is stronger than ever. In response to this incentive, new developments are emerging in a myriad of scientific fields; including neuroscience and behavioral psychology. We've all heard of the polygraph; however that machine is fast becoming old news. In its place are things such as this device, the Handy Truster. (ask two questions). We'll find out how accurate it is later. Today I'm going to tell you about the latest technologies for detecting lies. First we'll expose the facts about new devices, and then I'll tell you no lies as we look at the implications of this new technology.

In an effort to find a more foolproof detection method, gears are shifting to investigating not the reaction to the lie, but what the brain is actually doing while the lie is being told. Three ways in which this is being done is through functional magnetic resonance imaging, the electroencephalograph, and "Brain Fingerprinting". Because lying is an infinitely more complicated process than telling the truth, when we lie, we create a lot of work for our brains. What's this work? First we must hear and analyze the question that is being asked of us. Then, we think of the true answer before telling an already devised false answer. All this adds up to a lot of activity in the brain. The functional magnetic resonance imaging machine, or fMRI, sends out powerful magnetic fields that measure then map the movement of blood in the brain. This lets the person running the fMRI know when there is an increase in brain activity. Daniel Langleben, an assistant professor at the Pennsylvania Department of Psychiatry, led a study using fMRI research in which volunteers were given \$20.00 and a playing card in an envelope. They were told that if they were to deny having the card during a computerized interrogation. If they could convince the computer they didn't have the card, they got to keep the money. To make the experiment most accurate, he neglected to inform the subjects that the computer already knew that they were lying. His findings suggested that when we lie, there is an increase in nerve firing in the anterior cingulate cortex, which manages conflicting impulses, and the left lateral prefrontal cortex, which is involved in response inhibition. Like the polygraph, there are problems with fMRIs. One such problem is the fact that when being given an fMRI, the subject has to hold extremely still. Additionally, the machine is large, and like the tests themselves, expensive. An alternative to the fMRI is the electroencephalograph or EEG. Rather than measuring blood flow like an fMRI, an EEG measures electrical output of the brain. Unlike fMRI machines, EEGs are, according to reporter Polly Shulman, "relatively cheap, portable and unobtrusive."

"Brain Fingerprinting" focuses on a specific brain wave called a P300, so named because it takes about 300 milliseconds after a person sees a familiar stimulus for the wave to show. In 1991, psychologist Emanuel Donchin and his graduate student Lawrence Farwell at the University of Illinois at Urbana-Champaign showed that a guilty person produces P300 when shown a detail of the incident within a group of unrelated words or images. Last year, Farwell introduced "Brain Fingerprinting" as a means of lie detection. He claims that it can be used to determine whether a suspect was at the scene of the crime by showing the subject key details from the crime and then seeing if the image generates P300. For instance, if the victim was wearing a blue coat, then when shown a picture of a blue coat the suspect would fire off P300s. To use "Brain Fingerprinting" the suspect would put on a headband of electrodes and face a computer screen. The screen would then flash the pictures. Farwell has mass marketed the device and has used it to test CIA agents. He's also used "Brain Fingerprinting" to determine the guilt of criminals. In 2000, "Brain Fingerprinting" was ruled admissible as evidence, even though the polygraph is not, in Iowa in the trial of Terry Harrington. Harrington was convicted of a murder he denied committing in 1978, however, "Brain Fingerprinting" served as an exonerator. Harrington didn't recognize things that the murderer should have recognized, and did recognize things that were consistent with his alibi. Harrington is now appealing for a new trial. You'll notice that Farwell's professor didn't take part in the unveiling of "Brain Fingerprinting". This is because he has doubts about its effectiveness. He points out that a person could produce a P300 "spike" even if they hadn't been near the crime, but had seen whatever image was shown in a magazine or on the T.V.

They say that the eyes are the window to the soul. Using new technology, scientists are hoping to get a peek. Earlier this year, James Levine of the Mayo Clinic found that when we lie we blush around our eyes. This blushing is not like the blushing that occurs on our faces, it's not so much an increase in color but an increase in temperature. Because this eye blushing is so subtle, it can only be perceived by a thermal imaging camera, which detects changes in temperature. During his study, Levine had people stab a mannequin and then steal \$20.00 from it. They were then told to lie about committing this "crime". The practical application for this technology manifests itself in the fervent desire for increased airline security. Using the thermal imaging cameras, you would be asked the same questions that are presently asked at the airport. The difference would be that while you answered your face would be scanned.

There was a time, not so long ago, when people had to judge people without the benefit of machines and brain scans. How was this accomplished you ask? In the excitement over all this new technology, it's easy to forget that each of us is somewhat adept in lie detecting, using nothing more than our eyes. Ancient Babylonians observed "when a man lies, he looks down at the ground and moves his big toe in circles." According to the Body Language Dictionary, when we lie, we look down and to the left. We can also exhibit antigravity signs. This is done by trying to elevate ourselves by standing on or extending our toes. John Mole adds that liars typically touch their face, putting their hands over their mouths, or pulling on their ears. However, some people have become so adept at lying that

these "tells" don't apply. Just as people figured out how to beat a polygraph so have they figured out how to beat other people. They are not out of the clear yet, though. For, although FMRI, EEGs, "Brain Fingerprinting", and thermal imaging machines are not in your local stores yet, countless other devices, from expensive machines that use electrodes and thermal images to small voice based detectors at \$19.99, already have. One of the most popular forms of personal lie detectors are voice analyzers. A small version of the voice analyzer, the Handy Truster, is available on the internet and boasts an 84% accuracy rating. According to the manufacturer, the machine picks up on the changes that occur in the vocal chords as a result of a change in blood pressure that occurs when lies are told. The tiny machine has a microphone on its side that picks up the subject's voice. The tester asks 10-15 seconds worth of yes or no questions with truthful answers that helps the machine get a read on the person being tested. The tester can then ask the yes or no question they want to truly know the answer to. The screen features an apple, which when lies are told, has bites taken out of it.

We all lie. Be they white, whoppers, or exaggerations, often what we say can most softly be phrased as an alternative version. However, it seems that soon alternative versions will be phased out with true versions. As Adam Sutherland, director of the Grizedale Arts program in England which recently hosted the "Festival of Lying" points out about lie technology, "Yes, it would be the contemporary equivalent of God, but it would of course require a backup of hellfire and brimstone." This hellfire and brimstone can be renamed the loss of privacy. The safest place to keep something is often in ones thoughts. However, now this new technology manages to cross even that border. Moreover, although this technology might make some feel safer, they also emphasize a society in which it is the norm not to trust. The lengths to which people are willing to go to insure that they are hearing the truth, such as buying hand held devices, attests to an insecurity that previously might have been combated by conversation, but which is now turning to the collection of gizmos. And finally, as secure as knowing the truth might seem, might it not be true that it is in fact more secure not to know the truth? We all create safety nets for ourselves and sometimes they are threaded with untruths. You really have no intention of calling that looser you went out with. You think your friend's sweater is hideous, and truth be told, the reason your paper didn't get turned in on time was not because you were suddenly stricken with the flu. But life sure is easier if people don't know these things. And as much as there are things you don't want others to know, most likely there exists things that you don't really want to know. So the question is not if the truth is out there. The question is, do we really want to find it?

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